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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/773,356	02/01/2001	Shinichi Miyazaki	0033-0689P	5541

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EXAMINER	
FISCHER, JUSTIN R	

ART UNIT	PAPER NUMBER
1733	6

DATE MAILED: 10/10/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/773,356	MIYAZAKI ET AL.	
	Examiner	Art Unit	
	Justin R Fischer	1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 September 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Starinshak (US 5,279,695, of record). Starinshak is applied in the same manner as set forth in Paper Number 3, Paragraph 3.

As best depicted in Figure 1, Starinshak is directed to a 1x12 cord construction for use in pneumatic tires. The reference further states that the interstices of the cord are filled with styrene polybutadiene rubber (SPBD) in order to improve metal adhesion and corrosion resistance by one of two methods: (a) coating the core filaments with SPBD having a melting temperature below the tire vulcanization temperature or (b) constructing a cord by incorporating one or more SPBD monofilaments by standard bunching, each monofilament having a melting temperature below the tire vulcanization temperature into the core (Column 4, Lines 10-51). In both instances, Starinshak suggests that the SPBD have a melting temperature between 70 °C and 200 °C, which is almost the identical range of the claimed invention (Column 3, Lines 35-38). Additionally, Starinshak is directed to a plurality of cord constructions such that at least three steel filaments are present (Column 3, Lines 45-49). Thus, the reference clearly suggests a hybrid or composite cord formed of steel and a polymer having a melting

point in accordance to the limitations of the claimed invention, wherein the cord has a 1xn construction.

Regarding claim 2, although Starinshak does not give a specific range for the metallic filament diameter, all of the embodiments detailed by the reference contain metallic filament diameters that fall within the claimed range (Column 7, Lines 64-66 and Column 8, Lines 15-17 and lines 60-62).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Starinshak in view of Nakamura (WO 85/02210, of record). Starinshak and Nakamura are applied in the same manner as set forth in paper Number 3, Paragraph 4. Starinshak discloses a 1xn tire construction formed of at least three steel filaments and one or more SPBD monofilaments, such that the SPBD monofilament will melt and disperse throughout the interstices between said steel filaments during vulcanization of the tire (Column 6, Lines 1-11). The reference further suggests that a blend of rubbers can be used and suggests the use of various polydiene rubbers such as polybutadiene, polyisoprene, and styrene butadiene (Column 6, Lines 12-20). It should be noted that this cord construction improves rubber to metal adhesion and corrosion resistance. However, Starinshak is completely silent to the use of polyethylene or polypropylene.

Nakamura, on the other hand, describes the use of a wide variety of non-metallic, core materials that have a lower melting temperature than the rubber article (tire). In particular, Nakamura suggests the use of natural rubber, styrene butadiene rubber, polyisoprene rubber, polyethylene, and polypropylene to improve the rubber to metal adhesion and corrosion resistance. As such, it would have been obvious to one of ordinary skill in the art at the time of the invention to use either polyethylene or polypropylene in the cord construction of Starinshak, as set forth below.

In describing the non-metallic core filaments, Starinshak discloses the use of polybutadiene rubber, polyisoprene rubber, and styrene butadiene rubber such that the melting temperature of the core filament(s) is below the tire vulcanization temperature and the core filament(s) disperse into the interstices upon being exposed to said vulcanization temperature. Although the reference is silent as to the use of plastic filaments, Nakamura specifically suggests the use of rubber, plastic, and organic fibers to fill the interstices of a steel cord in order to improve rubber to metal adhesion and prevent corrosion (Abstract). In particular, Nakamura describes the use of polybutadiene rubber, polyisoprene rubber, and styrene butadiene rubber (same rubbers as Starinshak) and the use of polyethylene and polypropylene. Table 1 of Nakamura describes the polyethylene as having a melting point between 125 °C and 135 °C and the polypropylene as having a melting point between 165 °C and 173 °C. Thus, one of ordinary skill in the art at the time of the invention would have readily appreciated the use of polyethylene or polypropylene to fill the interstices in the cord construction of Starinshak in view of Nakamura since Nakamura describes the use of

rubber and plastic core materials as alternatives in order to improve the rubber to metal adhesion and the corrosion resistance.

5. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Starinshak. Starinshak discloses a 1x12 cord construction in which one or more SPBD monofilaments (as a cord) are incorporated into the interstices by standard bunching, each monofilament having a melting temperature below the tire vulcanization temperature (Column 4, Lines 10-51). The reference, however, is silent as to the specific twisting structure, only stating that the cords are prepared by standard bunching and stranding procedures (Column 4, Lines 46-51). One of ordinary skill in the art at the time of the invention would have recognized "standard bunching" of a 1x12 cord construction to define all the filaments being twisted as a "bunch" in the same direction and at the same pitch and as such, no individual filament would form a core of the composite cord. Thus, the claimed cord construction would have been obvious to one of ordinary skill in the art at the time of the invention in view of Starinshak.

Response to Arguments

6. Applicant's arguments filed September 16, 2002 have been fully considered but they are not persuasive. Applicant provides the following primary argument with respect to the rejection set forth in Paper Number 3: the cord construction of Starinshak contains fiber filaments that define a "core" and metallic filaments that define a "sheath". In turn, applicant has amended the independent claims to include the limitation "wherein no fiber constitutes a core of the composite cord whereby metallic filaments do not form a sheath around the core".

As stated in the rejection above, Starinshak discloses a 1x12 (disclosed as a 12x cable construction) cord construction, wherein at least one filament is formed of a rubber compound that has a melting point lower than the vulcanization temperature of the rubber article to be vulcanized (tire). In this instance, the remainder of the cord construction is formed of steel filaments. By defining a 1x12 construction, the filaments are necessarily twisted together in a "bunch twisting" procedure as compared to a 3+9 cord construction in which nine sheath filaments are twisted around a core formed of three filaments. In the cord construction of Starinshak, there is no "core" filament or filaments since the nine outer filaments are not wrapped around the three inner filaments- the nine outer filaments are actually wrapped with the three inner filaments. Contrary to this construction, the terms "core" and "sheath" are recognized as defining a cord construction in which the nine outer filaments would be wrapped around a three-filament core over the entire extent of the cord (layered structure). Thus, the three-filament core would be existent over the entire extent of the cord in a layered structure. Therefore, the cord of Starinshak does not have a "core" and "sheath" consistent with the accepted definitions of these layers. To further evidence this position, a publication entitled "Metallurgy, Processing and Applications of Metal Wires" has been supplied, it being specifically noted that Figure 4 (Page 79) depicts a layered 3+9 cord construction formed of a core layer (inner three) and a sheath layer (outer 9) and a compact 1x12 cord construction in which all the filaments are twisted together (bunch twisted) and there is no "core" or "sheath" filament layer.

Applicant provides a second argument with respect to the rejection of claim 3 in which case applicant contends that Nakamura forms a sheath of metallic filaments around the core, which creates a closed gap between the metallic filaments and prohibits the rubber to penetrate into the closed gap during melting. While Nakamura discloses a core/sheath construction, it should be initially noted that Nakamura is not being applied to teach a 1xn construction- the reference is being used to evidence the use of a plurality of non-metallic materials to form an inner filament such that said non-metallic filaments have a lower melting point than the vulcanization temperature of the rubber article to be vulcanized. In particular, Nakamura suggests the use of natural rubber, styrene butadiene rubber, polyisoprene rubber, polyethylene, and polypropylene to improve the rubber to metal adhesion (dimensional stability) and corrosion resistance. Thus, one of ordinary skill in the art at the time of the invention would have recognized that the use of either rubber or plastic inner filaments results in a improved cord construction, as long as said rubber or plastic inner filament has a melting point lower than the vulcanization temperature of the rubber article too be vulcanized (inner filament melts and penetrates between metallic filaments).

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Justin R Fischer** whose telephone number is (703) 605-4397. The examiner can normally be reached on M-F (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Ball can be reached on (703) 308-2058. The fax phone numbers

for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Justin Fischer

October 7, 2002